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ABSTRACT

Computer capability was added to the Media Learning Center in 1979 to help faculty with computer based learning (CBL) applications in basic skills (English and Math) as well as regular coursework in the sciences, social sciences, and the humanities. The DEC PDP 11/70 time-sharing system operated with 356K memory and serves 32 student video terminals at the Center and other remote locations in the College of Liberal Arts. Applications range from simple drill and practice to tutoring programs, problem-solving, and graphic simulations in statistics and physics. Strategies to promote the use of CBL are described, including the provision of a range of opportunities for faculty to learn about computer uses in their fields; acquisition of a variety of existing courseware for demonstration; location of sources of information on resources and applications; development of faculty rewards and incentives; and the taking of an active role by the Learning Lab Director to provide and promote this new instructional service. (Author/CHH)

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DEVELOPMENT OF A SMALL TIME-SHARING COMPUTER BASED LEARNING SYSTEM IN THE MEDIA LEARNING CENTER, TEMPLE UNIVERSITY

by

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The Media Learning Center in the College of Liberal Arts at Temple University grew out of the old Language Laboratory. With state funds provided to furnish a new Humanities Building, the old Lab was able to be reborn as a full fledged self study media center to serve all departments in the arts and sciences. In 1976 the new Center opened with a 130 student position audiocassette Sony Learning Lab System featuring two consoles. In addition we provided 30 slide and tape carrels, 10 filmstrip carrels and 10 video carrels. In the following year the College decided to spend the remaining funds for the building on an instructional computer, thus adding 32 computer terminals to the existing student facilities.

There were several reasons why the College decided to acquire its own computer as a new learning resource. First, a few faculty had specific instructional projects that were in the process of being planned and that required the use of a computer. The Psychology Department had been looking for a system which could test large numbers of students on units in their introductory course at regular intervals throughout the semester. There was an expressed need to provide drill and practice exercises for students in basic skills in English, foreign language, math and sciences. Such exercises could provide students with learning experiences in a one-to-one tutorial mode while receiving immediate confirmation of their success and progress. Faculty in the Physics and Sociology Departments also expressed an interest in a system which could provide them with computer graphics to demonstrate to students simulations of physical laws or techniques

for display of statistical data.

Another reason the College decided that it should acquire a small time-sharing system to serve instructional needs alone came from problems in gaining access to the university's existing computer. Faculty who had attempted to use the university's large heavily used multi-purpose time-sharing system sometimes found that their jobs lacked priority. Students working on terminals interactively were often subject to long delays in getting responses from the over-taxed system. Also, there was no student computer lab available, and professors had to make their own special arrangements to give their students access to their own computer terminals. A new system which could be dedicated to instructional uses alone would thus give students a faster response time. The Media Learning Center had already established itself as a place for students throughout the College to gain access to self study media resources at anytime during the day. Thus, the placement of computer terminals alongside the audio, slide, filmstrip and video carrels was a natural addition to round out the facilities of this existing CLA Center. By providing both dedicated lines and regular phone lines to the computer, the system has the flexibility of providing terminals both at the MLC central site and at remote sites throughout the College.

With only a few liberal arts faculty making use of computer initially, it was bold of the Dean to commit the College to a new system. With few computer specialists on staff, it fell to me as the Director of Media Resources to provide the leg work to get the system specified for the state bid process. Working with faculty users, a computer-skilled Psych graduate student, our university Computer Center staff, the Purchasing Department,

and two primary vendors, the specifications were finally written.

Politically there were problems from the beginning. The Computer Center was miffed because they were not the ones to order and receive the system. Some faculty doubted the wisdom of spending so much money for a system of little proven value to the liberal arts. Others questioned the placement of such a resource in a media center. Some simply wanted the terminals in their labs or offices with no central plan.

Faculty assistance however was an essential step in acquiring the new system, first in writing the needs assessment, and then in the evaluation of vendor bids. The faculty committee also drafted the specific criteria that helped guide us to a decision on an appropriate computer system for the College. We were looking for a system which would give us the following.

1. Quick response time on a large number of student terminals was deemed essential. Previous experience on the university's heavily used multi-purpose system had lead to the decision to go for a small system for the College devoted to instruction. Five second response time on all 32 terminals being run simultaneously was thus a maximum in our specs.
2. The memory storage capacity of the system was a second major factor. We were looking for a system that could handle a variety of student users in a variety of courses and uses. This was not easy for us to specify accurately, since for the most part, we were projecting future use. Little CAI was being used at the time. Our specifications therefore required a system with a minimum capacity of 128 K.
3. We were also looking for a flexibility of terminal use: a system able to handle both hard wired ports and phone ports so that terminals

could be located in a central accessable place, as well as be available for check out for approved sites throughout the College.

4. Another criteria to provide flexibility was the specification of a variety of terminals. All but one administrative terminal at the MLC was to be a video screen type terminal. Video terminals were deemed essential to alleviate noise and paper print-out mess, and to provide security for testing applications. We ordered four different models of terminals, with a range of capacity from standard models up to ones to be used to generate advanced computer graphics.
5. Another criteria was the quality of the vendor's contributed CAI library. The vendor was to be responsible for providing a library of acceptable courseware so that the College would be able to have immediate use of the system with existing computer learning programs.
6. Another large consideration in evaluating a system was the ease of operation and the amount of training necessary for both technical staff and faculty users. Without a large staff or budget for this phase, this criteria was important to insure future college use and operation. Along with this, the successful vendor had to be able to provide quick and efficient service to the system. A two year service contract was thus written into the initial purchase package.

Operation of the System.

After our system was specified, evaluated, bid and awarded, Temple decided it was in its best interest to split the system, placing the main frame in the new Computer Activity Building, and leaving the terminals in the MLC. The central Computer Activity people have then been given the task of operating the system, providing both service and consultation. The College, with no full time computer staff on board and reluctant to add new staff, agreed to this organization.

The College now subcontracts for some computer services and the Center provides service at the terminal site. While we have gained the expertise of a large computer operation, it means, however, that many different people are involved. Needless to say, communication is one of the major problems with such an arrangement.

The final system installed was a DEC 11/70 system with a memory of 356 K, more than double what we had specified. The memory units, central processor and disk drive with console and printer then reside in the Computer Building on Broad Street. The 32 terminals consist of 15 DEC VT 100 a versatile video terminal with limited line graphics, 12 DEC VT 55s an older model video terminal with more graphics capability, 4 Tektronix series super graphics terminals with a dry copy unit, and a standard DEC Writer for on site administrative hard copy listings, and reports.

Despite the technical, political and budgetory difficulties, the system is getting use. The Writing Program in the College has begun to use it to assist with the onerous task of tutoring students in the basic principles of grammar, sentence structure and language. Two "ready made"

programs were obtained from other institutions in order to evaluate this use of the computer: DIALOG, developed by Susan Wittig at the University of Texas; and GRAMMR, developed by Leslie Olsen at the University of Michigan. Local refinements have been added to help students access the programs more easily, and allow faculty to get accurate records on the progress and success of their students in specific modules of the programs. This semester the programs have been made available to students upon referrel from either their instructors, or their tutors at the Writing Clinic. Initial responses by students has been most positive. Studies to examine the effect of this resource upon a student's writing ability are planned as the next step.

The Physics Dept. has utilized one of the advanced graphic terminals to demonstrate graphic simulations of physical principles for students within his own lab and lecture hall. Similarily, the Psychology Dept. have used terminals located at Weiss Hall to have their students learn concepts in statistics and visual perception. Recently the Geography Dept. has utilized computer graphics programs to demonstrate mapping principles in a graduate course.

One new use of the computer this semester has been an innovative experiment in the teaching of Mathematics. Students were instructed in the basics of computer programming and taught to write their own programs to solve mathematical problems. Motivated by working with a current and popular technology, students have enthusiastically learned not only useful programming skills, but also needed basic math skills.

During the first summer semester a new course called Computers in Science will be taught by faculty in the Physics Department. Students will

be taught programming and will spend one class hour each day in the Lab working on their own programs and manipulating information under the supervision of their instructor. This will be the first intensive use of the system for active programming by students throughout a regular daily schedule.

The University has recently set a priority for computer literacy for all students. While this move appears to be somewhat political to many, and no one is sure how the term is to be defined, let alone how operationalized, yet these noises seem to be having some effect on liberal arts faculty use. The College is now thinking more seriously about mounting efforts to introduce computer applications where applicable to specific departmental courses before some unacceptable approach is dictated from above.

Even with this external pressure for change, a great many faculty within our College remain unconvinced of the worth of computers. Therefore, one of the most important services I can render as a learning resource center director is to help faculty get to know the potential of this complex and rather frightingly powerful new resource. Only with more information, experience, and review of materials and programs will faculty be able to make intelligent decisions about computer uses.

Strategies for Promotion of CBE in the Learning Lab.

1. Provide a variety of opportunities for faculty and departments to learn about computer applications appropriate for them. Our experience at Temple with general faculty workshops has not been enthusiastic. The vendor was unprepared to work with university level people or even provide much information about instructional applications of this system.

Our Computer Center people have tried too. They have given some excellent seminars, but they are not well attended. Also, they too have the problem of making themselves fully understood to an academic group. We have been more successful with specific task workshops when a department of program asks to look at computer resources to solve a specific problem. It was through such a departmental workshop that the Writing Program was moved from initial skepticism to being the heaviestcurrent user. It is important to follow up on faculty leads, questions, interests. Personal one-to-one contact still remains the best means to get results with faculty who are uncertain and pressed with other priorities.

2. Locate and acquire existing computer programs developed for university level courses. Such resources are not always easy to find. Differences in both hardware and software configurations often frustrate this strategy. Yet the lack of good programs with which to demonstrate the computer's capability has been one of our largest stumbling blocks. With the excessive development skill and time demanded to create such programs in house, our faculty has been somewhat reluctant to begin their own development. One strategy to begin to get faculty interested in using computer resources, is to acquire existing programs and adapt them for use within your own curriculum. While both academic and technical questions may arise, this approach does provide a relatively easy method by which faculty can evaluate the potential for use of the computer in their own courses.

3. Locate Sources of Information on Computer Resources.

It is important for LL Directors to locate and maintain good

sources of information on computer applications courseware. One source is the user s group associated with the vendor. Thus far, the DEC Users group has been only partially helpful to us. The DECUS contributed library of programs is not supported by DEC, and although it contains many useful programs, the program quality is uneven and many have inadequate documentation. There have been few university level CAI type programs available from other DEC users, although more instutions are now installing systems.

It is difficult for most to find the time, energy or even the means to communicate with other users of similar computer systems. By the time information gets out, either needs or resources can change. Even when you are able to find existing programs in the right subject area, local differences either in system configuration or in academic program can prevent implementation of the program.

One organization that has attempted to overcome some of the quality control and system uniformity problems, is an Iowa-based non profit consortium, CONDUIT. Their materials are brought up to an agreed upon standard for implementation on a variety of systems. We have found them useful in securing ready-made programs in Writing skills, Chemistry and Spanish.

Other computer users, like Cal State at Fresno, are willing to share their CAI materials with other users at the cost of the medium. Both these groups have been most helpful to us as we start out promoting use of our system using existing materials.

One source of information on various programs available is the Index to Computer Based Learning, edited by Anastasia Wong at the

Instructional Media Laboratory at the University of Wisconsin, Milwaukee. This 1978 volume includes programs for use in PLATO, IBM, DEC, Honywell and other systems. Unfortunately, the index has become outdated already with rapidly expanding programming. A new edition is currently underway. I have only been 50% successful in getting responses from programmers listed here.

Journals and professional organizations provide sources of information, not just on programs, but also on new computer applications, equipment, lab facilities, and design and development ideas. The Association of Educational Data Systems publishes the AEDS Journal and Monitor. The Association for the Development of Computer Based Instructional Systems publishes the Journal of Computer Based Instruction. Both groups have newsletters, regular conferences and workshops with more information to share. One new newsletter for micro computer useers in languages is called MICRO and is published by SMALL: the society for Microcomputing Application in language & Learning. Commercial journals such as Computer World and BYTE are useful too. And our regular media journals like Educational Technology and even our own AECT Instructional Innovator and NALLD Journal are becoming good resources for information on computer uses.

There is much information out there; but it is spotty, and often out of date when you get it. Yet it is important to have a variety of sources for faculty to read and review if you are to promote the use of this technology.

4. Promote and provide incentives for faculty involvement.

The lack of incentives for faculty to develop any kind of

learning resources remain a continual problem for all instructional development staff. Such work represents a sacrifice in time, merit, and promotion for faculty who are struggling to obtain tenure, promotion and academic stature within their discipline. While some institutions are moving to change their priorities, the traditional stress on research and publication inhibits faculty from spending time on development of resources to assist the teaching program. There is no easy solution to overcome this problem for those of us interested in the development of learning resources. Besides locating existing resources, LL Directors can assist faculty by being ready to assist when called upon, by keeping the development task as simple and direct as possible and by providing as much help as possible. If much of the technical design, development, programming and testing can be carried out by support staff, faculty will be more willing to involve themselves in projects.

5. Last of all, <u>as a learning lab director, take an active role</u>. There is a role for the LLD in the use of computers in learning. We have the space, the administrative facilties and most importantly the developmental expertise to assist faculty to implement this resource into their curriculum. We must learn as much as we can about the resource. We must search out the innovators and opinion leaders in the departments that we serve, and work with them. We must be on the lookout for funding opportunities, and tie ourselves into departmental projects, which can provide the funds to purchase both equipment and faculty development time.

There are political, economic and academic dangers in assimilating

a new technology into our labs; yet there is no question now that this technology will continue to play an expanding role in the education of learners, if not in the schools, then certainly at home or on the job. The LL Director must be informed and involved in the process of developing useful learning materials for the computer. We cannot afford to let the computer specialist or the faculty tackle this enormous task all alone. There is a role for all, and all are needed to develop and provide access to the best learning materials possible. With cooperation between specialists from all areas:

academic, developmental, administrative and technical this powerful new resource can make a significant contribution to our instructional programs. We are very much aware that using the computer may very well change the pattern of the traditional classroom; it may also mean that the use of more flexible computer systems might also mean a change in the pattern of the learning lab. Computers may well be the catalyst in this decade for the long - awaited, and soon to be discussed, Renaissance of the Learning Lab.